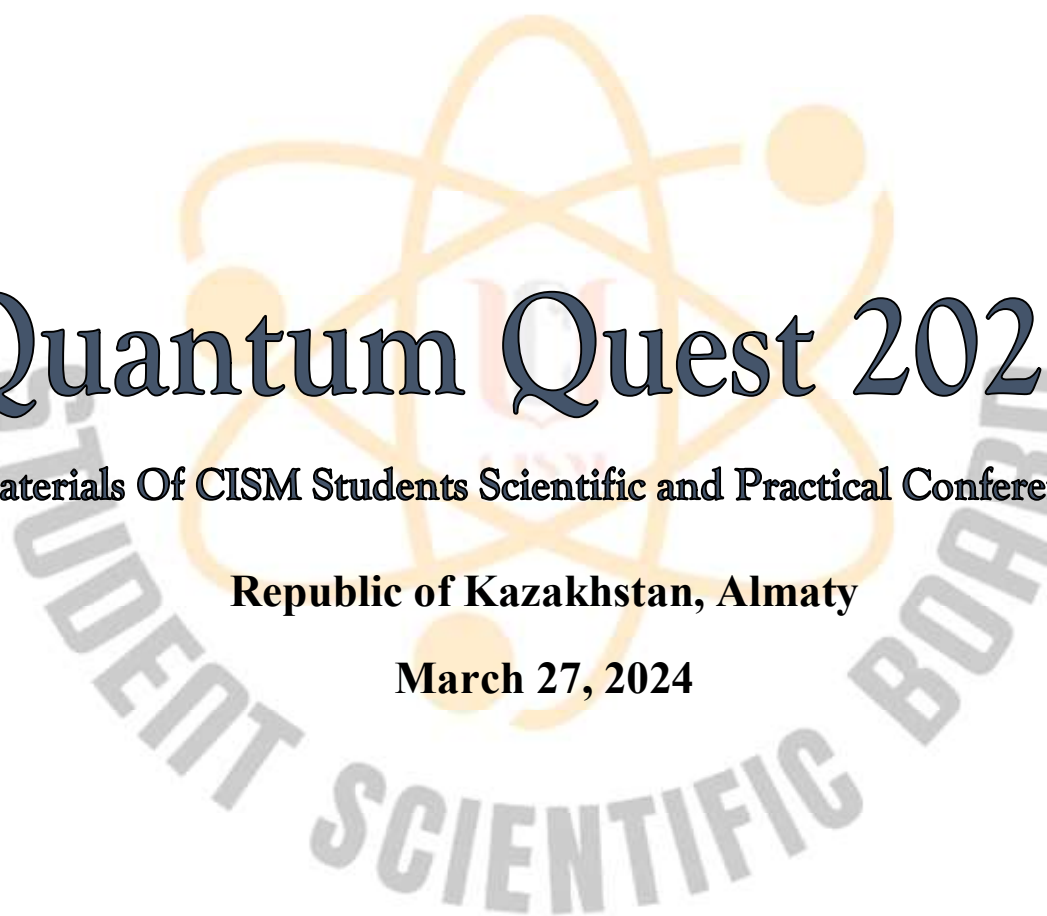


Quantum Quest 2024

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Preventive and clinical medicine: abstracts of the 2nd International Student Scientific and Practical Conference/ Caspian Public University, Caspian International School of Medicine; editorial board: Zh.K. Ismailov [and others]. – Almaty

The collection includes abstracts of reports of participants in the International Student Scientific and Practical Conference on the topic: “QUANTUM QUEST.” The theses highlight current problems of medicine and medical education. The topics cover research in the field of modern trends in the development of the theory and practice of medicine, problems and prospects for the development of healthcare, methodology and practice of the development of modern medical education through the eyes of students.

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Conference Report: Quantum Quest 2024

The Caspian International School Of Medicine was abuzz with excitement as it hosted the prestigious “Quantum Quest” on March 27, 2024. This event, a cornerstone of scientific inquiry and student innovation, was meticulously organized by the Student Scientific Board in collaboration with BB partners, marking a significant milestone in the school’s history.

Quantum Quest opened with an inaugural ceremony that set the tone for the day’s intellectual pursuits. The event saw an overwhelming participation from students eager to showcase their research and findings in various scientific domains. The air was charged with anticipation and a collective spirit of discovery.

The competition was structured to challenge the brightest minds and foster a collaborative environment. Students presented their projects with poise and confidence, engaging with judges and peers in meaningful discourse. The presentations were not only a testament to their hard work but also reflected the high caliber of mentorship provided by their guides.

The first prize was awarded to Rashi Chandra, whose research stood out for its originality and potential impact. Under the expert guidance of Mirsaliyev Mirkhoshim and ELkendi Taufic, Rashi’s work shone brightly as a beacon of student excellence.

The second prize was claimed by a dynamic trio: Bee Bee Hajira, Kalakata Gnanasekhar Reddy, and Jangili Bharat. Their collaborative effort, nurtured by Ainur Yerlan’s mentorship, demonstrated the power of teamwork and collective intellect.

Securing the third prize was Toke Sharavani, whose dedication and perseverance under Tolegen Gauhar’s guidance were truly commendable. Sharavani’s project reflected a deep understanding of scientific principles and a strong commitment to research.

As the event unfolded, respected teachers and board members welcomed students, participants, and guests with open arms. Their presence underscored the supportive community at Caspian International School Of Medicine and their commitment to fostering academic excellence.

The closing ceremony was a heartfelt tribute to all those who contributed to Quantum Quest’s success. It celebrated not just the winners but every participant who dared to question, explore, and innovate.

In conclusion, Quantum Quest was more than just a competition; it was a celebration of young minds driven by curiosity and guided by knowledge. The event left an indelible mark on all attendees, inspiring them to continue their quest for scientific truth.

Congratulations once again to all winners and participants for pushing the boundaries of science and setting new benchmarks for future Quantum Quests.

CONTENT

Immunological Indicators Of The State Of Local Immunity In Patients With Different Course Of Chronic Generalized Periodontitis. (Kharat Vaishnavi Vilas)	6
Comparitive Characteristics Of The Level Of Anxiety Of Undergraduate Students At Cism (Bee B.H., Kalakata G.R., Jangili B.K.)	11
Anti-Inflammatory Remedy : Curcuma Longa (Himanshu J. Keskar).....	15
Features Of The Course Of Acute Respiratory Distress Syndrome (ARDS) Associated With HIV Infection. Clinical Case (Sonal Yarmal, Abuzar Shaikh).....	17
Research Of Freeze-Dried Camel Milk «Extrashubat» And The Possibility Of Its Use For The Treatment And Prevention Of Type 2 Diabetes Mellitus (Gollapalli Sanjana).....	25
Neo Goat Milk (Kharat Vaishnavi Vilas)	30
Freeze-Dried Mare's Milk "Neosaumal" And The Possibility Of Its Use For The Treatment And Prevention Of Liver Diseases And Other Health Diseases (Toke Shravani).....	33
Vailex-comparative characteristics of the new washing gel (Vaibhav Gupta, Leema Soni, Anshul Yadav)	38
The study of the properties of soap on Goat's milk(Shashank Sharma)	42

Improving intensive care management for chronic obstructive pulmonary disease (COPD) (Rashi Chandra)	45
Atherosclerosis (Balne Harshitha)	56
Human Papilloma Virus : Testing In the Prevention Of Cervical Cancer (Aparna, Divesh Parmar)	58
Exercise physiology for disable people (Gugulothu C.P Dugyvala)	61
Unreveling the complexity of congenital orbital tumors : insights and innovations (Nikitha Gaini, sabrika morigala)	66
Xenotransplantation (Priyanka Yadav Kriti Khandelwal)	68
ARDS (Meher Quazi)	70
Sauna (Kapil Mudkhedkar, Prathmesh Rajput).....	79
Tears As A Promising Biomarker For Alzheimer's Disease (Aditi Nannore, Rajshri Aher, Sanaya Shaikh)	82
Evaluation Of The Effectiveness Of Thioctacid In The Treatment Of Diabetic Neuropathy In Patients With Type 1 And Type 2 Diabetes Mellitus (Ajay Duddy)	88
Fetoinfertile Mortality (Parmendra Singh Chandra Prakash)	91
Tuberculosis Leptomeningitis (Salman Wani)	93

References:

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FREEZE-DRIED MARE'S MILK "NEOsauMAL" AND THE POSSIBILITY OF ITS USE FOR THE TREATMENT AND PREVENTION OF LIVER DISEASES AND OTHER HEALTH DISEASES

Toke Shravani

Consultant - Tolegen G. A.

Caspian International School Of Medicine

Introduction :

Mare milk (SAUMAL) is milk lactated by female horses, known as mares, to feed their foals. It is rich in whey protein, polyunsaturated fatty acids and vitamin C, and is a key ingredient in kumis. In several European countries, including Germany, it is sold powdered. Mare milk is sometimes chosen over cow milk for its purported health benefits. A niche market considers it a remedy for skin or digestive problems. Peer-reviewed papers suggest it can reduce atopic dermatitis or eczema. It is used to make cosmetics and can form cheese with camel rennet, but not bovine. It has been consumed by humans for centuries

across various cultures, particularly in Central Asia. It is known for its unique nutritional profile and potential health benefits. Mare's milk can serve as a nutritious addition to the human diet. Due to its unique composition and health benefits, it is often used as a dietary supplement in many cultures. It can be consumed raw, fermented into a beverage known as kumis, or used to produce cheese and other dairy products. However, it's essential to note that mare's milk should always be consumed responsibly, considering the sustainability and welfare of the horses involved in its production.

Mare milk is an animal milk that is closest to breast milk because of its composition. The horse and man are both mono-gastric creatures. By comparison, a cow has four different gastric pouches. Horse and man assimilate the different components of food in a similar way, and their milk is therefore similar to each other. Besides, for a long time, the mare's milk was used as a milk substitute for newborn children, even in many maternity hospitals in France. The mare's milk has completely disappeared from French maternity in the aftermath of World War II, although mare's milk use had already decreased significantly for several years.

Mare milk is a rather poor milk casein (protein) provider. This poverty makes it a much more digestible milk than cow's milk. This is one of the reasons why the mare's milk can be recommended for young children whose liver has trouble assimilating components of cow's milk. Mare's milk is also recommended for adults whose bodies cannot tolerate cow's milk. Mare milk is also very rich in lysozyme, while only traces of this enzyme are found in cow's milk. The lysozyme is an enzyme acting as an antimicrobial agent. Mare's milk is also rich in lactoferrin, a glycoprotein that facilitates iron absorption by the body and which would have antibacterial, antioxidant and anti-inflammatory properties in addition to strengthening the immune system. Mare milk, because the animal is mono-gastric, is rich in monosaturated fatty acids whose role is to contribute to the reduction of "bad cholesterol". Mare's milk is also rich in vitamin C (antioxidant) and vitamin D that intervene in prevention of cancers and diabetes. Due to its low amount in casein and beta-lactoglobulin, mare's milk is only slightly allergenic.

Mare's milk can have an important role in the immune system because of some key components. First, it must be said that this milk contains immunoglobulin G, immunoglobulin A and immunoglobulin M. IgG is the only one with the ability to cross biological membranes. On the basis of a secondary immune response, most immunoglobulins belong to this type. IgA may be secreted by mucous membranes and exocrine glands, making a most important action on the surface of mucous membranes and fluids. IgM is responsible for developing a balance of intravascular space, so it stimulates a primary response. In addition to

the described immunoglobulins, it should be noted that the whey protein is present in mare's milk.

Lactoferrin has an antimicrobial activity which provides protection against the pathogenic bacteria that colonize the mucosa. It is used as a natural antiseptic. Lactoferrin participates in the antimicrobial activity against gram positive and some gram negative, but also against some viruses and fungi. It features a modulator of the immune response, stimulates or inhibits various hormonal and cellular components involved in the prevention and/or resolution of the infection and inflammation associated with these".

Lysozyme also has an antiseptic activity. It acts on certain bacteria by removing the polysaccharide component of their cell walls. It also has anti-inflammatory activities.

The B-lactoglobulin has antimicrobial and antiviral properties. It can inhibit the Gastronomic pathogens, promote the immune response of the body and regulate the development of the cell.

The a-lactalbumin is a bactericide, an antimicrobial agent and it is an inducer of apoptosis.

Milk proteins such as bioactive peptides have various properties. Including the regulation of blood pressure, anti-microbial and anti-inflammatory. The above-described proteins contain amino acids essential for the proper functioning of the body but the mare's milk contains amino acids that are also more easily absorbed. Among them, the following should be mentioned:

Aspartic acid helps the immune system, it causes increased production of immunoglobulins and antibodies.

Serine is useful for maintenance of a healthy immune system and contributes to the production of immunoglobulins and antibodies.

Lysine has great antiviral properties and enhances the immune function and antibody production.

Histidine is needed for the production of red and white cells in the blood. It improves the immune response.

Mare milk also contains a significant number of vitamins that are related to the immune system, they are presented below:

Vitamin A or retinol increases the immune function.

Vitamin B2 or riboflavin regulates the growth of red blood cells and helps maintain a strong immune system.

Vitamin B5 or pantothenic acid is necessary for the formation of antibodies to minimize the toxic effects of certain antibiotics, and for help in healing wounds.

Vitamin C or ascorbic acid helps fight bacterial and viral diseases.

Vitamin E or tocopherol regulates the binding of platelets and increases the immune response, for example by stimulating red blood cells to become more resistant.

Thus, it is not the action of each component individually, but the sum of these that provides support to the body against various pathogens

PREPARATION OF FREEZE-DRIED MARE'S MILK

1. Milk preparation, filtration Primary milk processing includes the following technological operations: purification of milk from mechanical impurities.

2. Pasteurization The best indicators of organoleptic evaluation are milk under pasteurization mode (60°C with an exposure of 30 minutes), which retains the colour and uniformity characteristic of raw milk, its taste and smell are close to raw mare's milk.

3. Cooling After carrying out the pasteurization process at a temperature of 60°C for 30 minutes, the milk must be cooled to $37-38^{\circ}\text{C}$ for the fermentation process.

4. Fermentations A starter culture consisting of thermophilic lactic acid bacteria and lactic yeast of the *Torula* type was introduced at a temperature of $37-38^{\circ}\text{C}$. At this temperature, the mixture was kneaded for 1 hour and 20 minutes, and then matured until a titratable acidity of $42-47^{\circ}\text{T}$ was reached.

5. Kneading and maturation of milk with prolonged maturation, the milk mixture was kneaded for 1 hour and 20 minutes and left to mature. After 2 hours and 30 minutes, the milk mixture was rejuvenated with milk of the next milk yield and after repeated kneading for 1 hour and 20 minutes and rest, the milk fermentation was activated, carbon dioxide was released, the surface of the mixture was covered with a uniform layer of the smallest foam

6. Freezing and transportation Prior to the implementation of the vacuum freeze-drying process, the milk is pre-prepared for drying. Milk is poured into special containers with a depth of 8-15 mm, which are then placed in a refrigerator, where they are frozen at a temperature of -14°C . Frozen drinks with a depth of 8-15 mm in the same containers are placed in a sublimation chamber.

7. Sublimation vacuum drying Frozen drinks with a depth of 8-15 mm in the same containers are placed in a sublimation chamber with a loading volume of

up to 2 litres consisting of a drying chamber (sublimator), a condenser and a vacuum pumping system. With the help of devices in the installation, temperature and vacuum are controlled. (40-50°C) The end of the sublimation process is estimated by the residual pressure in the drying chamber using a vacuum gauge.

A study named as Clinical-biochemical and Fibroelastometric Results of the Mare's Milk Application in Non-Alcoholic Steatohepatitis was conducted.

Non-alcoholic fatty liver disease (NAFLD) is most wide spread liver disease in the world, which represents the liver component of metabolic syndrome and nowadays 20-33% of adults, are suffering from it. Basic conditions in prevention and treatment of NAFLD are maintaining healthy lifestyle, increasing physical activity and calorie restrictions.

The study aimed to evaluate the effectiveness of the use of freeze-dried mare's milk in NASH.

RESULTS:

The result of the study demonstrates noticeable gain not only in the clinical symptoms of the disease but also in the laboratory and instrumental indicators, as well as health improvement and a decrease in symptoms of concomitant pathology. Taking mare's milk not only normalized liver biochemical parameters but also decreased cholesterol metabolism (total cholesterol, LDL, TG), the degree of liver steatosis, and existing hepatomegaly declined too. This pleiotropic effect of mare's milk points to the pathogenetic feasibility for the use of Saumal in NAFLD, including NASH.

CONCLUSIONS:

Addressing the problems of healthy nutrition in NASH, mare's milk can be considered as a pathogenetically justified, highly effective, and affordable natural therapeutic and prophylactic agent.

The value of the product is determined by its multicomponent balanced qualitative composition. Hepatoprotective, hypocholesterolemic, and lipotropic properties of mare's milk in this pathology are marked.

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